

WHAT IS CLAIMED IS:

1. A developer carrier for carrying a developer, the developer carrier comprising:

an opposing region that opposes a latent image-

5 carryable region on an image carrier, and

a solid portion that is solid at an end portion of the developer carrier in a longitudinal direction thereof;

wherein an end of the solid portion, which is on a side of a center of the developer carrier in the longitudinal

10 direction, is located closer to the center of the developer carrier than an edge of the opposing region.

2. The developer carrier according to claim 1, wherein the developer carrier is formed by fitting a solid axial member

15 into an end portion of a hollow roller in the longitudinal direction.

3. The developer carrier according to claim 1, wherein the developer carrier is manufactured by conducting at least one

20 of cutting and polishing.

4. A developing device comprising:

a developer carrier for carrying a developer, including

an opposing region that opposes a latent image-

25 carryable region on an image carrier, and

a solid portion that is solid at an end portion of the developer carrier in a longitudinal direction thereof,

wherein the developing device develops a latent image carried in the latent image-carryable region with the

5 developer carried on the developer carrier, and

an end of the solid portion, which is on a side of a center of the developer carrier in the longitudinal direction, is located closer to the center of the developer carrier than an edge of the opposing region.

10

5. The developing device according to claim 4, wherein the developer carrier is formed by fitting a solid axial member into an end portion of a hollow roller in the longitudinal direction.

15

6. The developing device according to claim 4, wherein the developer carrier is manufactured by conducting at least one of cutting and polishing.

20 7. The developing device according to claim 4, further comprising an abutment member that abuts against the developer carrier along the longitudinal direction of the developer carrier,

wherein the developer carrier is supported at both ends

25 in the longitudinal direction thereof so that the developer

carrier is abutted with the abutment member along the longitudinal direction of the developer carrier.

8. The developing device according to claim 7, wherein the  
5 abutment member presses the developer carrier towards the image carrier.

9. The developing device according to claim 7, wherein the abutment member is a developer supply member for supplying  
10 the developer to the developer carrier.

10. The developing device according to claim 7, wherein the abutment member is a layer thickness regulating member for regulating a layer thickness of the developer carried on the  
15 developer carrier.

11. The developing device according to claim 4, wherein the developer carrier is made of metal.

20 12. The developing device according to claim 4, wherein the developing device develops the latent image carried in the latent image-carryable region in a state that the developer carrier and the image carrier are not in contact with each other.

13. A developing device comprising:

    a developer carrier for carrying a developer, including

        an opposing region that opposes a latent image-

        carryable region on an image carrier, and

5       a solid portion that is solid at an end portion of

        the developer carrier in a longitudinal direction thereof,

        wherein the developing device develops a latent image

        carried in the latent image-carryable region with the

        developer carried on the developer carrier, and

10      an end of the solid portion, which is on a side of a

        center of the developer carrier in the longitudinal

        direction, is located closer to the center of the developer

        carrier than an edge of the opposing region,

        wherein the developer carrier is formed by fitting a

15     solid axial member into an end portion of a hollow roller in

        the longitudinal direction,

        wherein the developer carrier is manufactured by

        conducting at least one of cutting and polishing,

        wherein the developing device further comprises an

20     abutment member that abuts against the developer carrier

        along the longitudinal direction of the developer carrier,

        and

        the developer carrier is supported at both ends in the

        longitudinal direction thereof so that the developer carrier

25     is abutted with the abutment member along the longitudinal

direction of the developer carrier,

wherein the abutment member presses the developer carrier towards the image carrier,

wherein the abutment member is a developer supply

5 member for supplying the developer to the developer carrier

wherein the developer carrier is made of metal,

wherein the developing device develops the latent image carried in the latent image-carryable region in a state that the developer carrier and the image carrier are not in

10 contact with each other.

14. An image forming apparatus comprising a developing device including:

an image carrier for carrying a latent image, and

15 a developer carrier for carrying a developer, the

developer carrier including an opposing region that opposes a latent image-carryable region on the image carrier and a solid portion that is solid at an end portion of the developer carrier in a longitudinal direction thereof,

20 wherein the developing device develops a latent image

carried in the latent image-carryable region with the developer carried on the developer carrier, and

an end of the solid portion, which is on a side of a center of the developer carrier in the longitudinal

25 direction, is located closer to the center of the developer

carrier than an edge of the opposing region.

15. A computer system comprising:

a computer mainframe;

5 a display device connectable to the computer mainframe  
and

an image forming apparatus connectable to the computer  
mainframe, the image forming apparatus comprising a  
developing device including:

10 an image carrier for carrying a latent image, and  
a developer carrier for carrying a developer, the  
developer carrier including an opposing region that opposes  
a latent image-carryable region on the image carrier and a  
solid portion that is solid at an end portion of the  
15 developer carrier in a longitudinal direction thereof,

wherein the developing device develops a latent image  
carried in the latent image-carryable region with the  
developer carried on the developer carrier, and

20 an end of the solid portion, which is on a side of a  
center of the developer carrier in the longitudinal  
direction, is located closer to the center of the developer  
carrier than an edge of the opposing region.

16. A developing device comprising:

25 a developer carrier for carrying a developer,

wherein the developing device develops a latent image carried on an image carrier with the developer carried on the developer carrier, in a state that the developer carrier and the image carrier are not in contact with each other,  
5 and

a deflection amount of the developer carrier at an end portion of the developer carrier in a longitudinal direction thereof is smaller than a deflection amount at a center of the developer carrier in the longitudinal direction.

10

17. The developing device according to claim 16, further comprising an abutment member that abuts against the developer carrier along the longitudinal direction of the developer carrier,

15

wherein the developer carrier is supported at both ends in the longitudinal direction thereof so that the developer carrier is abutted with the abutment member along the longitudinal direction of the developer carrier.

20

18. The developing device according to claim 17, wherein the abutment member presses the developer carrier towards the image carrier.

19. The developing device according to claim 17, wherein  
25 the abutment member is a developer supply member for

supplying the developer to the developer carrier.

20. The developing device according to claim 17, wherein  
the abutment member is a layer thickness regulating member

5 for regulating a layer thickness of the developer carried on  
the developer carrier.

21. The developing device according to claim 16, wherein  
the developer carrier is made of metal.

10

22. The developing device according to claim 16, wherein  
the latent image carried on the image carrier is developed  
with the developer using a jumping development format.

15 23. A developing device comprising:

a developer carrier for carrying a developer, wherein  
the developing device develops a latent image carried on an  
image carrier with the developer carried on the developer  
carrier in a state that the developer carrier and the image  
20 carrier are not in contact with each other, and

a deflection amount of the developer carrier at an end  
portion of the developer carrier in a longitudinal direction  
thereof is smaller than a deflection amount at a center of  
the developing carrier in the longitudinal direction,

25 wherein the developing device further includes an

abutment member that abuts against the developer carrier along the longitudinal direction of the developer carrier, and

the developer carrier is supported at both ends in the 5 longitudinal direction thereof so that the developer carrier is abutted with the abutment member along the longitudinal direction of the developer carrier,

wherein the abutment member presses the developer carrier towards the image carrier,

10 wherein the abutment member is a developer supply member for supplying the developer to the developer carrier, wherein the developer carrier is made of metal, and wherein the latent image carried on the image carrier is developed with the developer using a jumping development 15 format.

24. A developer carrier that carries a developer for developing a latent image carried on an image carrier in a state that the developer carrier and the image carrier are 20 not in contact with each other,

wherein the deflection amount of the developer carrier at an end portion of the developer carrier in a longitudinal direction thereof is smaller than a deflection amount at a center of the developing carrier in the longitudinal 25 direction.

25. An image forming apparatus comprising a developing device including:

an image carrier for carrying a latent image, and

5 a developer carrier for carrying a developer,

wherein the developing device develops a latent image carried on the image carrier with the developer carried on the developer carrier in a state that the developer carrier and the image carrier are not in contact with each other,

10 and

a deflection amount of the developer carrier at an end portion of the developer carrier in a longitudinal direction thereof is smaller than a deflection amount at a center of the developer carrier in the longitudinal direction.

15

26. A computer system comprising:

a computer mainframe;

a display device connectable to the computer mainframe;

and

20 an image forming apparatus connectable to the computer mainframe, the image forming apparatus comprising a developing device including

an image carrier for carrying a latent image, and

a developer carrier for carrying a developer,

25 wherein the developing device develops a latent image

carried on the image carrier with the developer carried on the developer carrier in a state that the developer carrier and the image carrier are not in contact with each other, and

5 a deflection amount of the developer carrier at an end portion of the developer carrier in a longitudinal direction thereof is smaller than a deflection amount at a center of the developer carrier in the longitudinal direction.

10 27. A developer charging unit comprising:

a developer charging member for charging a developer carried on a developer carrier; and

15 a support member for supporting the developer charging member, the support member being fixed with the developer charging member by spot welding,

wherein the support member includes a first bent portion and a second bent portion that are formed by bending a rectangular member along a longitudinal direction thereof,

20 the support portion supports the developer charging member and

a direction in which the first bent portion is bent is opposite to a direction in which the second bent portion is bent, and

25 the developer charging unit includes a determining member for determining a free length of the

developer charging member.

28. The developer charging unit according to claim 27,  
wherein the free length determining member includes an  
5 abutment portion for abutting against the developer charging  
member, and a distance from an end of the abutment portion  
closest to a free length end of the developer charging  
member to the free length end is shorter than a distance  
from a fixed portion, at which the developer charging member  
10 and the support member are fixed, to the free length end.

29. The developer charging unit according to claim 28,  
wherein the developer charging member is nipped between the  
free length determining member and the support member.

15  
30. The developer charging unit according to claim 29,  
wherein the developer charging member includes an elastic  
body that abuts against a surface of the developer carrier  
and an elastic body support member for supporting the  
20 elastic body, and  
the elastic body support member is nipped between the  
free length determining member and the support member.

31. The developer charging unit according to claim 30,  
25 wherein a thickness of the elastic body support member is 1

mm or less.

32. The developer charging unit according to claim 28,  
wherein the abutment portion and the developer charging  
5 member are fixed by spot welding.

33. The developer charging unit according to claim 27,  
wherein the developer charging member and the support  
portion are fixed by spot welding at plural places along a  
10 longitudinal direction of the developer charging member.

34. The developer charging unit according to claim 27,  
wherein the support member is fixed by screws to the free  
length determining member at both end portions of the  
15 support member in a longitudinal direction thereof.

35. The developer charging unit according to claim 27,  
wherein the spot welding is laser welding.

20 36. A developer charging unit comprising:  
a developer charging member for charging a developer  
carried on a developer carrier; and  
a support member for supporting the developer charging  
member, the support member being fixed with the developer  
25 charging member by spot welding,

wherein the support member includes a first bent portion and a second bent portion that are formed by bending a rectangular member along a longitudinal direction thereof,

the support portion supports the developer charging

5 member and

a direction in which the first bent portion is bent is opposite to a direction in which the second bent portion is bent, and

the developer charging unit includes a free length

10 determining member for determining a free length of the developer charging member,

wherein the free length determining member includes an abutment portion for abutting against the developer charging member, and a distance from an end of the abutment portion

15 closest to a free length end of the developer charging member to the free length end is shorter than a distance from a fixed portion, at which the developer charging member and the support member are fixed, to the free length end,

wherein the developer charging member includes an

20 elastic body that abuts against a surface of the developer carrier and an elastic body support member for supporting the elastic body, and the elastic body support member is nipped between the free length determining member and the support member,

25 wherein a thickness of the elastic body support member

is 1 mm or less,

wherein the developer charging member and the support portion are fixed by spot welding at plural places along a longitudinal direction of the developer charging member,

5 wherein the support member is fixed by screws to the free length determining member at both end portions of the support member in a longitudinal direction thereof, and the spot welding is laser welding.

10 37. A developing device including

a developer carrier for carrying a developer, and  
a developer charging unit including a developer  
charging member for charging the developer carried on the  
developer carrier and a support member for supporting the  
15 developer charging member,

wherein the developer charging member and the support  
member are fixed by spot welding, and

the developing device develops a latent image carried  
on an image carrier with the developer carried on the  
20 developer carrier,

wherein the support member includes a first bent  
portion and a second bent portion that are formed by bending  
a rectangular member along a longitudinal direction thereof,

the support portion supports the developer charging  
25 member and a direction in which the first bent portion is

bent is opposite to a direction in which the second bent portion is bent, and

the developer charging unit includes a free length determining member for determining a free length of the developer charging member.

38. An image forming apparatus including

an image carrier for carrying a latent image,

a developer carrier for carrying a developer, and

10 a developer charging unit including a developer

charging member for charging the developer carried on the developer carrier and a support member for supporting the developer charging member,

wherein the developer charging member and the support

15 member are fixed by spot welding, and

the image forming apparatus develops the latent image carried on the image carrier with the developer carried on the developer carrier,

wherein the support member includes a first bent

20 portion and a second bent portion that are formed by bending a rectangular member along a longitudinal direction thereof,

the support portion supports the developer charging member,

a direction in which the first bent portion is bent is

25 opposite to a direction in which the second bent portion is

bent, and

the developer charging unit includes a free length determining member for determining a free length of the developer charging member.

5

39. A computer system comprising:

a computer mainframe;

a display device connectable to the computer mainframe;

and

10 an image forming apparatus connectable to the computer mainframe, the image forming apparatus including

an image carrier for carrying a latent image,

a developer carrier for carrying a developer, and

a developer charging unit that includes a developer

15 charging member for charging the developer carried on the developer carrier and a support member for supporting the developer charging member,

wherein the developer charging member and the support

member are fixed by spot welding, and the image forming

20 apparatus develops the latent image carried on the image carrier with the developer carried on the developer carrier,

wherein the support member includes a first bent

portion and a second bent portion that are formed by bending a rectangular member along a longitudinal direction thereof,

25 the support portion supports the developer charging

member,

a direction in which the first bent portion is bent is opposite to a direction in which the second bent portion is bent, and

5 the developer charging unit includes a free length determining member for determining a free length of the developer charging member.

40. A heat releasing device for a developing device in a  
10 rotary development unit in which a selected one of developing devices is placed adjacent to a photosensitive body in an image forming apparatus by rotating the developing devices in a loaded state about a rotary shaft so that toner within the selected developing device is moved  
15 onto the photosensitive body,

the developing device comprising:

a housing having a peripheral surface and two end faces at the both sides of the peripheral surface;

20 a toner container formed in the housing and containing toner;

a roller for supplying the toner in the toner container onto the photosensitive body; and

a gear provided on a metal rotation shaft of the roller outside the housing for rotatively driving the roller;

25 wherein the gear has a double-layer structure

constructed by an outer part made of resin formed with gear teeth in an outer periphery and an inner part made of sintered metal positioned inside of the outer part, the inner part being inserted by and fixed with the rotation 5 shaft of the roller.

41. A heat releasing device for a developing device according to claim 40, wherein the roller for supplying toner onto the photosensitive body is a supply roller 10 provided adjacent to the toner container and having a rotation shaft rotatably supported by the two end faces and a developing roller having a peripheral surface in contact with a peripheral surface of the supply roller and a rotation shaft rotatably supported by the two end faces.

15

42. A heat releasing device for a developing device according to claim 41, wherein the gear in the double-layer structure is a developing-roller driving gear for driving the developing roller.

20

43. A heat releasing device for a developing device according to claim 42, wherein the developing-roller driving gear has a peripheral surface formed with first and second gear parts different in diameter and adjacent with respect 25 to a rotation axis direction, the inner part lying astride

the first and second gear parts.

44. A heat releasing device for a developing device according to claim 40, wherein the gear in the double-layer 5 structure is formed by insert-molding an outer part member in a state that the inner part is present.

45. A developing device having a heat releasing device according to claim 40.

10

46. A deformation preventing device for a developing device in a rotary development unit in which a selected one of developing devices is placed adjacent to a photosensitive body in an image forming apparatus by rotating the 15 developing devices in a loaded state about a rotary shaft so that toner within the selected developing device is moved onto the photosensitive body, the developing device comprising:

20 a housing having a peripheral surface and two end faces at the both sides of the peripheral surface;

a toner container formed in the housing and containing toner;

25 a supply roller provided adjacent to the toner container and having a rotation shaft rotatably supported by the two end faces;

a developing roller having a peripheral surface in contact with the peripheral surface of the supply roller and having a rotation shaft rotatably supported by the two end faces;

5 a developing-roller driving gear provided at one end of the rotation shaft of the developing roller and having a first gear part formed with helical teeth on a peripheral surface thereof; and

10 an intermediate gear provided on a same side as the first gear part of the developing-roller driving gear, and having a rotation shaft supported by the end faces of the housing, and a peripheral surface formed with helical teeth in mesh with the first gear, for receiving a drive force from a driving source;

15 the helical teeth on the first gear of the developing-roller driving gear and the helical teeth on the intermediate gear being formed in a direction to urge the developing roller toward the first gear;

wherein the deformation preventing device is provided  
20 in a state restricted in axial movement on the support shaft of the intermediate gear, and

the deformation preventing device is in abutment against an end outer face of the housing on a side the intermediate gear is provided.

47. A deformation preventing device for a developing device in a rotary development unit in which a selected one of developing devices is placed adjacent to a photosensitive body in an image forming apparatus by rotating the 5 developing devices in a loaded state about a rotary shaft so that toner within the selected developing device is moved onto the photosensitive body, the developing device comprising:

10 a housing having a peripheral surface and two end faces at the both sides of the peripheral surface;

a toner container formed in the housing and containing toner;

15 a supply roller provided adjacent to the toner container and having a rotation shaft rotatably supported by the two end faces;

a developing roller having a peripheral surface in contact with the peripheral surface of the supply roller and having a rotation shaft rotatably supported by the two end faces;

20 a supply-roller driving gear provided at one end of the rotation shaft of the developing roller and formed with spur teeth on a peripheral surface thereof;

a developing-roller driving part provided at one end of the rotation shaft of the developing roller and having a 25 second gear part formed on a peripheral surface with spur

teeth in mesh with the supply-roller driving gear and a first gear part provided adjacent to the second gear part and formed with helical teeth on a peripheral surface thereof; and

5       an intermediate gear provided on a same side as the first gear part of the developing-roller driving gear and having a rotation shaft supported by the end faces of the housing, and a peripheral surface formed with helical teeth in mesh with the first gear, for receiving a drive force  
10      from a driving source;

      the helical teeth on the first gear of the developing-roller driving gear and the helical teeth on the intermediate gear being formed in a direction to urge the developing roller toward the first gear;

15      wherein the deformation preventing device is provided in a state restricted in axial movement on the support shaft of the intermediate gear, and

      the deformation preventing device is in abutment against an end outer face of the housing on a side the  
20      intermediate gear is provided.

48. A deformation preventing device of a developing device according to claim 46, wherein the intermediate gear is rotatable about the support shaft of the intermediate gear,  
25      the deformation preventing device having a pressure

dispersing plate placed in abutment against an outer surface of the housing at an area sufficiently broader than a section of the support shaft of the intermediate gear.

5 49. A deformation preventing device of a developing device according to claim 48, wherein the support shaft of the intermediate gear is fixed with a holding part, by the holding part the pressure dispersing plate being urged on the end outer face of the housing.

10

50. A deformation preventing device for a developing device according to claim 48, wherein the pressure dispersing plate is a metal plate.

15 51. A developing device having a deformation preventing device according to claim 46.

52. An image forming apparatus using a developing device according to claim 51.

20

53. A frictional-heat-generation suppressing device for a developing device in a rotary development unit in which a selected one of developing devices is placed adjacent to a photosensitive body in an image forming apparatus by 25 rotating the developing devices in a loaded state about a

rotary shaft so that toner within the selected developing device is moved onto the photosensitive body, the developing device comprising:

      a housing formed therein with a toner container;

5      a developing roller having a rotation shaft rotatably supporting by end faces of the housing;

      an urging device for urging the developing roller toward one of the end faces of the housing;

10     an end abutment part formed in an inner surface of the housing, to restrict from moving the end face of the developing roller positioned on a side in a direction the developing roller is urged; and

15     a low friction member provided in a manner sandwiched between the end face of the developing roller and the end abutment part.

54. A frictional-heat-generation suppressing device for a developing device in a rotary development unit in which a selected one of developing devices is placed adjacent to a 20 photosensitive body in an image forming apparatus by rotating the developing devices in a loaded state about a rotary shaft so that toner within the selected developing device is moved onto the photosensitive body, the developing device comprising:

25     a housing formed therein with a toner container;

a supply roller provided adjacent to the toner container and having a rotation shaft rotatably supported by end faces of the housing;

5 a developing roller having a peripheral surface in contact with a peripheral surface of the supply roller and a rotation shaft rotatably supported by the end faces of the housing;

an urging device for urging the developing roller on one of the end faces of the housing;

10 an end abutment part formed in an inner surface of the housing, to restrict from moving the end face of the developing roller positioned on a side in a direction the developing roller is urged; and

15 a low friction member provided in a manner sandwiched between the end face of the developing roller and the end abutment part.

55. A frictional-heat-generation suppressing according to claim 53, wherein the low friction member is a polyslider.

20

56. A frictional-heat-generation suppressing according to claim 53, wherein the urging device is structured by a developing-roller driving gear provided at one end of the rotation shaft of the developing roller and formed with 25 helical teeth in a peripheral surface thereof, and an

intermediate gear having a support shaft supported by the end faces of the housing and formed in a peripheral surface with helical teeth in mesh with the developing-roller driving gear, and

5 the developing roller is urged toward the developing-roller driving gear by an action of the helical teeth.

57. A developing device having a frictional-heat-generation suppressing device according to claim 53.

10

58. An image forming apparatus using a developing device according to claim 57.

59. An electric-contact urging device for an electric  
15 contact comprising:

a conductor elastic plate having an electric contact for contact with an end of a rotation shaft is fixed on a fixing member positioned around the end of the rotation shaft at first and second fixing parts, the electric contact  
20 with the end of the rotary shaft being positioned between the first and second fixing parts,

wherein the conductor elastic plate has a first arm part extending between the first fixing part and the electric contact and a second arm part extending between the  
25 second fixing part and the electric contact,

the first arm part and the second arm part intersect at an intersecting angle of 30 to 150 degree, and

the electric contact is elastically urged on and contacted with an end of the rotation shaft by an elasticity 5 of the conductor elastic plate.

60. An electric-contact urging device on a rotation shaft according to claim 59, wherein the intersecting angle is approximately 90 degrees.

10

61. An electric-contact urging device on a rotation shaft according to claim 59, wherein the first and second fixing parts are fixed by screws.

15 62. An electric-contact urging device on a rotation shaft according to claim 59, wherein the rotation shaft is a rotation shaft of a roller for toner carriage provided in a developing device capable of moving toner to a photosensitive body by positioning adjacent to the 20 photosensitive body of an image forming apparatus, and

the electric contact is to be used as an electricity feed base point for charging an outer peripheral surface of the roller.

25 63. An electric-contact urging device on a rotation shaft

comprising:

5 a conductor elastic plate having an electric contact for contact with one end of a rotation shaft that is fixed to a fixing member positioned around the end of the rotation shaft, at one fixing part;

the electric contact being formed close to a free end of a branch arm part branched from an intermediate of a third arm part extending from the one fixing part;

10 a fourth arm part bent approximately 90 degrees at an opposite end of the third arm part to the one fixing part and extending toward the other end of the rotation shaft;

the fourth arm part being formed with another fixing part for fixing the third arm part to the fixing member in a state of pulling toward the other end of the rotation shaft;

15 wherein the electric contact is elastically urged by and contacted with one end of the rotation shaft by an elasticity of the conductor elastic plate.

64. An electric-contact urging device on a rotation shaft  
20 according to claim 63, wherein the one fixing part and the other fixing part are fixed by screws.

65. An electric-contact urging device on a rotation shaft according to claim 63, wherein the rotation shaft is a  
25 rotation shaft of a roller for toner carriage provided in a

developing device for transferring toner to a photosensitive body by being placed adjacent to the photosensitive body of an image forming apparatus, the electric contact being to be used as an electricity feed base point for charging an outer 5 peripheral surface of the roller.

66. An electric-contact urging device on a rotation shaft wherein an electric-contact urging device according to claim 59 is provided on one conductor elastic plate.

10

67. A developing device having an electric-contact urging device on a rotation shaft according to claim 59.

15

68. A seal structure of a developing device comprising:  
a developing roller;  
a toner layer regulation member which is brought into contact with the developing roller; and  
seal members which are provided at both ends of the developing roller,

20 wherein hard resin adhesive is filled in a gap between said toner layer regulation member and the seal member.

69. The seal structure of developing device according to Claim 68, wherein said toner layer regulation member 25 comprises a leaf spring and a regulation blade, and

the hard resin adhesive is filled in a gap between the leaf spring and the seal member.

70. The seal structure of developing device according to  
5 Claim 69, wherein the hard resin adhesive is filled in a gap  
between the regulation blade and the seal member.

71. The seal structure of developing device according to  
Claim 68, wherein said hard resin adhesive is UV-curing  
10 adhesive.

72. A developing device comprising:  
a developing roller having a rotation shaft formed on  
both sides in an axial direction of the roller body; and  
15 a distance keeping member which is rotatably attached  
to said rotation shaft and comes into contact with a  
photosensitive body thereby to keep the distance between the  
roller body and the photosensitive body,  
wherein lubricant is filled between said distance  
20 keeping member and the rotation shaft.

73. The developing device according to Claim 72, wherein  
said lubricant is silicon oil or grease.

25 74. The developing device according to Claim 72, wherein a

lubricant absorber is interposed between said distance keeping member and the side surface of the roller body.

75. The developing device according to Claim 74, wherein a  
5 high sliding resin plate is arranged between said distance keeping member and the lubricant absorber.